but Dulong and Petit's values are too high, and Rosetti's too low.—Notes on silver, by M. Carey Lea.—Notes on silver chlorides, by the same. Fused silver chloride poured into petroleum and placed in the sunlight without removing it from the liquid, is instantly darkened. From this it appears that the presence of oxygen or moisture is not essential to the darkening of silver chloride in light. The chlorine may be taken up by some other substance.—A remarkable fauna at the base of the Burlington Limestone in north-eastern Missouri, by Charles Rollin Keyes.—Glacial pot-holes in California, by H. W. Turner.—The lavas of Mount Ingalls, California, by H. W. Turner.—A method for the quantitative separation of barium from strontium by the action of amyl alcohol on the bromides, by Philip E. Browning. The solubility of barium bromide is about 0·0013 grm. on the oxide in 10 cc. of amyl alcohol, while that of strontium bromide is 0·2 grm. To obtain the bromides, the precipitated and thoroughly washed carbonates of Ba and Sr are treated with hydrobromic acid obtained by the action of dilute sulphuric acid on potassium bromide.—Note on the method for the quantitative separation of strontium from calcium by the action of amyl alcohol on the nitrates, by P. E. Browning. Recent work on this method has shown that the total correction amounts to 0·0006 grm. on the strontium oxide, and 0·0010 on the calcium as sulphate.—Study of the formation of the alloys of tin and iron, with descriptions of some new alloys, by W. P. Headden.—Notes on the Cambrian rocks of Pennsylvania and Maryland from the Susquehanna to the Potomac, by C. D. Walcott.—Volcanic rocks of South Mountain in Pennsylvania and Maryland, by G. H. Williams.

Wiedemann's Annalen der Physik und Chemie, No. 11.—On the behaviour of allotropic silver towards the electric current, by A. Oberbeck.—On the indices of refraction of dilute solutions, by W. Hallwachs.—On capillary constants, by M. Cantor.—On the chemistry of the accumulator, by M. Cantor.—On the fall of potential during discharges, by O. Lehmann. A series of important investigations on discharges between electrodes and in tubes without electrodes.—Expansion of water with the temperature, by K. Scheel.—A method for determining the density of saturated vapours and the expansion of liquids at higher temperatures, by B. Galitzine. This method has the advantage of extreme simplicity combined with accuracy. A small glass tube, about 5 cm. long and a few mm. thick, is closed at one end and drawn out into a capillary at the other. After determining the weight and internal volume of the tube, a small quantity of the substance to be investigated is introduced into it in the liquid state. This is made to boil, and then the tube is sealed by fusing. On raising the temperature, the surface of separation between the liquid and its vapour is displaced, until at a certain temperature all the liquid is converted into saturated vapour. The tube is then cooled until the vapour reappears, when the temperature is again taken. This can be repeated several times, thus giving an accurate value for the density of saturated vapour at a certain temperature. The same process can be used to determine the expansion of the liquid. As the temperature rises, the volume of the liquid will in general increase up to a certain point, when the vaporization becomes more pronounced. This maximum, which can be observed more accurately by drawing out the tube near that point, gives a value for the expansion. For the density at that point is a function of the density at 0° C. and the temperature, and the pressure is that of the saturated vapour at the same temperature. Thus it is only necessary to find the volumes of the liquid and the vapour, and the density of the latter from the previous experiment.—On radiant energy, by B. Galitzine.—Note on the electricity of waterfalls, by J. Elster and H. Geitel.—Apparatus for demonstrating the Wheatstone bridge arrangement, by A. Oberbeck.—Determination of the coefficient of self-induction by means of the electro-dynamometer, by O. Troje.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 15.—On some new reptiles from the Elgin Sandstone, by E. T. Newton, communicated by Sir Archibald Geikie, F.R.S.

During the last few years a number of reptilian remains have been obtained from the Elgin Sandstone at Cuttie's Hillock, near Elgin, which are now in the possession of the Elgin Museum and of the Geological Survey. These specimens represent at least eight distinct skeletons, seven of which undoubtedly belong to the Dicynodontia, and one is a singular horned reptile, new to science. All the remains yet found in this quarry are in the condition of hollow moulds, the bones themselves having entirely disappeared. In order, therefore, to render the specimens available for study, it was necessary, in the first place, so to display and preserve these cavities that casts might be taken which would reproduce the form of the original bones. Gutta-percha was found to be the most suitable material for taking these impressions; and in some instances, especially in the case of the skulls, the casts had to be made in several parts and afterwards joined together.

The first specimen described is named *Gordonia Traquairi;* it is the one noticed by Dr. Traquair in 1885, and referred to the Dicynodontia; besides the skull, it includes fragmentary portions of other parts of the skeleton, and is contained in a block of sandstone which has been split open so as to divide the skull almost vertically and longitudinally. The two halves have been so developed that casts made from them exhibit the left side and upper surface, as well as the main parts of the palate and lower jaw. In general appearance this skull resembles those of *Dicynodon* and *Oudenodon*. The nasal openings are double and directed laterally; the orbits are large and look somewhat forwards and upwards. The supra-temporal fossa is large, and bounded above by the prominent parieto-squamosal crest, and below by the wide supra-temporal bar, which extends downwards posteriorly to form the long pedicle for the articulation of the lower jaw. There is no lower temporal bar. The maxilla is directed downwards and forwards to end in a small tusk. Seen from above, the skull is narrow in the inter-orbital and nasal regions, but wide posteriorly across the temporal bars, although the brain-case itself is very narrow. There is a large pineal fossa in the middle of a spindle-shaped area, which area is formed by a pair of parietals posteriorly and a single intercalary bone anteriorly.

The palate is continuous with the base of the skull; the pterygoids on each side send off a distinct process to the quadrate region. Towards the front the mediam part of the united pterygoids arches upwards, and the outer sides descend, forming a deep groove; from the evidence of other specimens it is clear that the palatines, extending inwards, converted this groove into a tube, and thus formed the posterior nares. The ramus of the lower jar is deep, with a large lateral vacuity, and the two rami are completely united at the symphysis. The back of this skull is not seen, but two other specimens, referable to this same genus, show that the occiput had two post-temporal fossæ on each side.

This specimen is distinguished from *Dicynodon* by the presence of two post-temporal fossæ on each side of the occiput, by the small size of the maxillary tusk; and probably by the elongated spindle-shaped area enclosing the pineal fossa, and also by the slight ossification of the vertebral centra.

A second and much smaller specimen, provisionally referred to *G. Traquairi*, has, besides the skull, a fore-limb well preserved. The humerus of this shows the usual Anomodont expansion of its extremities; its large deltoid crest is angular, and set obliquely to the distal end.

Three other species are referred to the same genus, namely:—

Gordonia Huxleyana, which is distinguished from *G. Traquairi* by its proportionately wider and more depressed skull, and by the absence of the concavity between the orbits which is present in the latter species. The humerus has the distal extremity oblique to the deltoid crest, which was probably rounded and not angular.

G. Duffiana has the skull even wider than in *G. Huxleyana*, and the portion of a humerus found with this skeleton has the two extremities set nearly at right angles to each other.

G. Juddiana has an elongated skull resembling that of *G. Traquairi*, but the parietal crests are less developed, the bones of the nasal region are much thickened and overlap the nasal apertures, the small tusk is placed a little further back and points more directly downwards, and the pineal fossa is smaller than in either of the other species.

A second generic form is named *Geikia Elginesis*. This is a skull nearly allied to *Ptychognathus*, Owen, but is distinguished by its shorter muzzle and the entire absence of teeth; the upper part of the skull, between the orbits, is also peculiar, forming a deep valley open anteriorly, with a ridge on each side, the anterio end of which forms a large prominence above and in front of the orbit. The occiput has only one (the lower) post-temporal fossa open on each side. The maxilla is produced into a tooth-like prominence, which occupies a similar position to the tusks of *Gordonia;* but the bone is too thin to have supported a tooth, and in all probability it was covered by a horny beak. The lower jaw has a strong symphysis, a distinct lateral vacuity, and the oral margin, at the foot of each ramus, bears a rugose prominence.

Elginia mirabilis is the name proposed for the skull of a reptile, which, on account of the extreme development of horns and spines, reminds one of the living lizards *Moloch* and *Phrynosoma.* The exterior of this skull is covered in by bony plates, the only apertures being the pair of nostrils, the orbits, and the pineal fossa. The surfaces of the bones are deeply pitted, as in crocodiles and labyrinthodonts. The horns and spines, which vary from ¼ in. to nearly 3 in. in length, are found upon nearly every bone of the exterior. The development of the epiotics, and the arrangement of the external bones, resemble more the Labyrinthodont than the reptilian type of structure; while the palate, on the other hand, conforms more nearly to the Lacertilian type, and, with the exception that the pterygoids are united in front of the pterygoid vacuity, agrees with the palate of *Iguana* and *Sphenodon.* There are four longitudinal ridges along the palate, some of which seem to have carried teeth. The oral margin was armed with a pleurodont dentition, there being on each side about twelve teeth with spatulate crowns, laterally compressed and serrated. With the exception of the smaller number of the teeth, we have here, on a large scale, a repetition of the dentition of *Iguana.* This peculiar skull seems to show affinities with both Labyrinthodonts and Lacertilians, and is unlike any living or fossil form; its nearest, though distant, ally apparently being the *Pareiasaurus* from the Karoo beds of South Africa.

Linnean Society, December 1.—Prof. Stewart, President, in the chair.—A letter was read from the Rev. Leonard Blomefield, expressing his high appreciation of the compliment paid him by the presentation of the illuminated address which had been signed by the Fellows present at the last meeting of the Society and forwarded to him.—Messrs. H. and J. Groves exhibited specimens of several Irish *Characeæ* collected during the past summer. *Nitella tenuissima* from Westmeath and Galway had not been previously recorded from Ireland, and a large form of *N. gracilis* from two lakes in Wicklow had been only once previously met with. Referring to the former, Mr. H. Groves remarked that although it might be expected to occur in all the peat districts it had only been found in two widely separated localities in England, namely, in the Cambridgeshire Fens and in Anglesea.—Mr. A. Lister made some remarks on the nuclei of Mycetozoa, exhibiting some preparations under the microscope.—Mr. E. Cambridge Phillips forwarded for exhibition a hybrid between red and black grouse, which had been shot in August near Brecon.—Mr. J. E. Harting exhibited and made remarks on some coleopterous larvæ which had been vomited by a child at Tintern, and had been forwarded by the medical attendant, Dr. J. Taylor Brown, for identification. The precise species had not been determined, but was considered to be allied to *Blaps mortisaga.* Mr. Harting drew attention to the fact that cases of voiding coleopterous larvæ were mentioned by Kirby and Spence (7th ed. p. 71), and by the late Dr. Spencer Cobbold in his work on parasites (1879, p. 269).—Mr. D. Morris exhibited some tubers of *Calathia allonia*, eaten as potatoes in Trinidad, where it is known as Tapee Nambour. Apparently a corruption from the French *topinambour* (artichoke).—A communication was read from Mr. J. H. Hart, of the Botanic Gardens, Trinidad, on *Œcodoma cephalotes* and the fungi it cultivates.—Prof. F. Jeffry Bell contributed a short paper on a small collection of Crinoids from the Sahul Bank, North Australia, some of which were new, and Mr. Edgar Smith communicated descriptions of some new land shells from Borneo.—The meeting adjourned to December 15.

Physical Society, December 9.—Mr. Walter Baily, Vice-President, in the chair.—The Chairman announced that an extra meeting would be held on January 13, 1893.—Prof. S. P. Thompson's communication on Japanese magic mirrors was postponed.—Mr. W. B. Croft read a paper on the spectra of various orders of colours in Newton's scale. After referring to the definition of the *order* of colours by reference to the retardation in wave-lengths, produced by different thicknesses of selenite between crossed polarizer and analyzer, the author went on to say that several books on optics implied that the number of bands in the spectra of these colours was the same as the order of the colour. On obtaining selenites of the first four orders of red from Messrs. Steeg and Reuter, he found that the first three orders gave one dark band each, and that of the fourth order three dark bands. Further experiments showed that the thicknesses of the selenites were in the proper proportions required to give the first four orders of red. The numbers of bands, the author explained, depended on the numerical possibilities of wave-length within the visible spectrum—that is, whether a multiple of the wave-length of one visible wave can be another multiple of a different wave. For example, taking the visible spectrum as extending from A (0·000760) to H (0·000394) and the wave-length of the line E in the green as 0·000527, it was shown that the first order of red was due to extinction of green by a thickness of crystal proportional to 1 × 0·000527, and would give one band in the green. For the second order, the thickness of crystal was proportional to 2 × 0·000527, viz. 0·001054, and this number was no other integral multiple of any other wave-length between A and H; consequently there could only be one band. Similarly it was shown that the third order of red could only have one band or possibly produce a shortening of the spectrum. With the fourth order of red three bands were obtainable, for 4 × 0·000527 = 3 × 0·000703 and = 5 × 0·000422. Three bands were therefore possible near E, A, G, respectively. At the conclusion of his paper, Mr. Croft directed attention to a very simple form of diffraction apparatus, by which most of the ordinary diffraction phenomena could be well seen, and which also served for spectrum observations. Mr. H. Miers pointed out that in Lewis Wright's "Practical Optics" a chart showing the bands corresponding to the first four orders of red was given. So far as he was aware, the subject was not fully discussed in the book. In reply, Mr. Croft said he had noticed Mr. Wright's chart, but believed the text implied that the number of bands should be the same as the order of the colour. Tyndall made definite statements to that effect.—Dr. W. E. Sumpner read a paper on the diffusion of light. The influence of diffusion in increasing the illumination of rooms and open spaces, had not, in the author's opinion, been sufficiently appreciated. Being impressed with the great importance of the subject, he was led to make determinations of the co-efficients of reflection, absorption, and transmission of diffusing surfaces. To give precision to terms sometimes vaguely used, several definitions were proposed. *Reflecting power* was defined as the ratio of the amount of light reflected from a surface to the total amount of light incident upon it; *illumination* of a surface, as the amount of incident light per unit of surface; *unit quantity* of light as the flux of radiation across unit area of a sphere of unit radius at whose centre a unit light is placed; and *brightness* as the candle-power per unit area in the direction normal to the surface. Denoting these quantities by η, I, Q and B respectively, and assuming the cosine law of diffusion (*i.e.* the candle-power in any direction is proportional to the cosine of the angle between the direction and the normal to the surface) it was shown that $\pi B = \eta I$, and that the average illumination (I′) of the walls of a room is related to the illumination (I) due to the direct action of the lights as expressed by the formula $I' = \frac{I}{1 - \eta}$. If the reflecting power of the walls, &c., be 50 per cent., $\eta = \frac{1}{2}$, and $I' = 2I$, whilst if $\eta = 0·8$, a number approximately true for white surfaces, then $I' = 5I$. The illumination due to the walls may, therefore, be far more important than that due to the direct rays from the lights. When the surfaces consist of portions of different reflecting power, the average reflecting power may be found from the equation $\eta = \frac{\eta_1 A_1 + \eta_2 A_2 + \&c.}{A}$, A being the total surface, and A_1, A_2, &c., the areas of surfaces whose reflecting powers are η_1, η_2, &c., respectively. This law is shown to be quite accurate for spherical enclosures. In measuring reflecting power, the surface was attached to a large screen of black velvet placed perpendicular to a 3-metre photometer bench. Two lights were used, one a Methven 2-candle standard placed at the end of the bench remote from the reflecting surface, and the other, a glow lamp of about 20 candle power, was attached to a slider which also carried a Lummer-Brodhun photometer. The glow-lamp served to illuminate the reflecting surface, but the photometer was screened from its direct rays. The formulæ used in reducing the observations are worked out in the paper and tables of results given. Absorbing power was determined by measuring the candle-power of a glow-lamp, first when uncovered, and then when surrounded by a cylinder of the substance under test. It was found to be of great importance to distinguish between apparent and real absorption, for reflection from the surfaces of the cylinders increases the internal illumination. The true absorption coefficient (a) is given by $a = (1 - \eta)\frac{k_0 - k_1}{k_0}$, where η is the reflecting power and k_1 and k_0 the candle-powers with and without the envelope of material under test. In determining transmitting power, the Methven standard and photometer were placed on one side of the surface and the glow-lamp on the other. Difficulties were experienced from the fact that some materials such as tracing paper, transmit part of the light directly (like transparent substances), and another part by diffusions according to the cosine law. Methods for discriminating between the different parts were therefore devised both in the reflection and transmission experiments, and consistent results subsequently obtained. Tables and curves showing the close agreement of calculated and observed values, are included in the paper. An abstract of some of the tables of numbers is given below :—

Material.	Percentage reflecting power η.	Percentage absorption a.	Percentage Transmission τ.	$\eta + a + \tau$
Blotting paper	82	13·8	9·2	105·0
Cartridge paper ...	80	12·2	11·2	103·4
Tracing cloth	35	15·0	54·4	104·4
Tracing paper	22	7·0	76·0	105·0
Ordinary mirror... ...	82			
Ordinary foolscap ...	50 to 70			
Tissue paper (one thickness	40			
Tissue paper (two thicknesses	55			
Yellow wall-paper ...	40			
Blue paper	25			
Dark brown paper ...	13			
Yellow painted wall ...	20			
Black cloth	12			
Black velvet	0·4	(apparent)		
Arc lamp globes—				
Light opal	—	15		
Dense opal	—	39		
Ground glass ...	—	42		

Theoretically the sum of the reflecting, absorbing and transmitting powers should be unity, but from the above table it will be noticed that they exceed 100 per cent., by amounts greater than can be accounted for by experimental error. This discrepancy, the author thought, might be attributed to the law of cosines not being exactly fulfilled. Mr. A. P. Trotter said he had been interested in the subject of diffusion for many years with a view to obviating the glare of arc lamps. Some experiments he made on reflecting power gave unsatisfactory results, owing, as he now saw, to his not taking the solid angles subtended by the reflecting surfaces into account. The reflecting power of substances was of great importance in the illumination of rooms; in one case measured by Dr. Sumpner and himself, two-thirds of the total illumination was due to the walls. It would greatly simplify measurement of reflecting power if some substance could be adopted as a standard. Referring to the cosine law, he said he had found it true, except when the angles of incidence approached 90°. In cases where considerable total reflection took place the apparent brightness near the normal direction was greatly in excess of that in other directions. These points he illustrated by polar curves. He had also considered what should be the nature of a roughened or grooved surface to give the cosine law of diffusion. No simple geometrical form of corrugations, &c., seemed to fulfil the required conditions. Dr. Hoffert said the high numbers given for the reflecting powers of substances were very interesting. Most people had noticed the effect of laying a white table cloth in an ordinary room. He had also observed that wall papers of the same pattern, but slightly different in colour, had very different effects in producing increased illumination, and wished to know if the influence of small differences in colour and texture on diffusing power, had been investigated. Mr. Blakesley defended the cosine law, and suggested that the summation of the powers exceeding unity might be due to the fact that the enclosure reflected heat as well as light, thus raising the temperature and increasing the efficiency of the radiant. Mr. Addenbrooke said the importance of the subject was impressed on him when he passed through America three years ago and noticed the crude manner in which electric lighting was there carried out. If using good reflecting surfaces increased the illumination of a room 50 per cent., it was like reducing the cost of electricity from 8*d.* to 4*d.* per unit. He could hardly conceive any subject of more practical importance than the one before the meeting. Dr. C. V. Burton did not understand why the cosine law should be objected to, for it was possible that no surface was perfectly diffusive. The effect of reflection from walls, &c., say in illuminating a book would not, he thought, be so great as would appear from the numbers given, for one usually read near a light, and the reflected light falling on the book was only a small part of the whole, on account of the greater distances of the walls. Another member pointed out that in experiments such as those described, it was very important to screen the photometer and surfaces from all radiation other than that under test. He rather doubted whether any surface reflected as well as mirrors. White surfaces might appear to do so, but this was probably because the eye would overestimate it, owing to the superiority of white in aiding distinct vision. Dr. Sumpner in reply said he had, as stated in the paper, used white blotting paper as a standard of reflecting power and found it very convenient. His most careful measurements had been made on whitish surfaces and not on coloured ones. Where one colour, say red, preponderates in a room, the average light would be much redder than that emitted by the source owing to the other colours being absorbed. In considering illumination as related to distinct vision, it was necessary to take account of the eye itself, for the pupil contracted in strong lights and opened in feeble ones. This subject he hoped to treat fully in a subsequent paper.

Entomological Society, December 7.—Frederick DuCane Godman, F.R.S., President, in the chair.—The President announced the death, on December 2, of Mr. Henry T. Stainton, F.R.S., an ex-President and ex-Secretary of the Society.—Mr. Jenner Weir exhibited a species of Acræa from Sierra Leone, which Mr. Roland Trimen, F.R.S., who had examined the specimen, considered to be a remarkable variety of *Telchinia encedon*, Linn. It was a very close mimic of *Limnas alcippus*, the usual West African form of *Limnas chrysippus*. The upper wings of the specimen were rufous and the lower white, as in the model, and the resemblance in other respects was heightened by the almost total suppression of the black spots in the disc of the upper wings, characteristic of the usual markings of *T. encedon.*—Mr. F. J. Hanbury exhibited a remarkable variety of *Lycæna adonis*, caught in Kent this year, with only one large spot on the under side of each upper wing, and the spots on the lower wings entirely replaced by suffused white patches. He also exhibited two specimens of *Noctua xanthographa* of a remarkably pale brownish grey colour, approaching a dirty white, obtained in Essex, in 1891; and a variety of *Acronycta rumicis*, also taken in Essex, with a dark hind margin to the fore wings.—Mr. H. J. Elwes exhibited a living specimen of a species of *Conocephalus*, a genus of *Locustidæ*, several species of which, Mr. McLachlan stated, had been found alive in hothouses in this country.—Dr. T. A. Chapman exhibited immature specimens of *Tæniocampa gracilis*, *T. gothica*, *T. populeti*, *T. munda*, *T. instabilis* and *T. leucographa*, which had been taken out of their cocoons in the autumn, with the object of showing the then state of development of the imagos.—Mr. F. W. Frohawk exhibited a living specimen of the larva of *Carterocephalus palæmon* (*Hesperia paniscus*) hybernating on a species of grass which he believed to be *Bromus asper*. The Rev. Canon Fowler and Mr. H. Goss expressed their interest at seeing the larva of this local species, the imagos of which they had respectively collected in certain woods in Lincolnshire and Northamptonshire. Mr. Goss stated that the food-plants of the species were supposed to be *Plantago major* and *Cynosurus cristatus*, but that the larva might possibly feed on *Bromus asper.*—Mr. C. G. Barrett exhibited a long series of remarkable melanic varieties of *Boarmia repandata*, bred by Mr. A. E. Hall from larvæ collected near Sheffield.—Mr. W. Farren exhibited four varieties of *Papilio machaon* from Wicken Fen; also a series of two or three species of *Nepticulæ* pinned on pith with the "minutien Nadeln," for the purpose of showing these pins.—Canon Fowler exhibited specimens of *Xyleborus perforans*, Woll., which had been devastating the sugar-canes in the West Indies.—Mr. E. B. Poulton, F.R.S., showed, by means of the oxy-hydrogen lantern, slides of various larvæ and pupæ, in illustration of his paper, read at the October meeting, entitled, "Further experiments upon the colour-relation between certain lepidopterous larvæ and their surroundings." He stated that he believed that nineteen out of twenty larvæ of *Geometridæ* possessed the power of colour adjustment. Mr. F. Merrifield, the Rev. J. Seymour St. John, and Mr. Jacoby took part in the discussion which ensued.—Mr. F. Merrifield read a paper entitled, "The effects of temperature on the colouring of *Pieris napi*, *Vanessa atalanta*, *Chrysophanus phlæas* and *Ephyra punctata*," and exhibited many specimens thus affected. Mr. Poulton, Dr. F. A. Dixey, Mr. Elwes, and Mr. Jenner-Weir took part in the discussion which ensued.—Mr. Kenneth J. Morton communicated a paper entitled, "Notes on *Hydroptilidæ* belonging to the European Fauna, with descriptions of new species."—Dr. T. A. Chapman read a paper entitled, "On some neglected points in the structure of the pupa of Heterocerous Lepidoptera, and their probable value in classification; with some associated observations on larval prolegs." Mr. Poulton, Mr. Tutt, Mr. Hampson, and Mr. Gahan took part in the discussion which ensued.—Mr. J. Cosmo-Melvill communicated a paper entitled, "Description of a new species of butterfly of the genus *Calinaga*, from Siam."—Mr. W. L. Distant communicated a paper entitled, "Descriptions of new genera and species of Neotropical *Rhynchota*."

PARIS.

Academy of Sciences, December 12.—M. d'Abbadie in the chair.—On certain asymptotic solutions of differential equations, by M. Emile Picard.—Description of a new electric furnace, by M. Henri Moissan. The furnace consists of two bricks of quicklime one upon the other, the lower one of which is provided with a longitudinal groove which carries the two electrodes, and between them is a small cavity serving as crucible, which contains a layer of several centimetres of the substance to be experimented upon. The latter may also be contained in a small carbon crucible. The highest temperature worked with was 3000° C., produced by a current of 450 amperes and 70 volts consuming 50 horse-power. In the neighbourhood of 2500°, lime, strontia and magnesia crystallized in a few minutes. At 3000° the quicklime composing the furnace began to run like water. At the same temperature the carbon rapidly reduced the oxide of calcium to the metallic state. The oxides of nickel, cobalt, manganese, and chromium were reduced in a few seconds at 2500°, and a button of uranium weighing 120 gr. was obtained from the oxide in ten minutes at 3000°.—Action of a high temperature on metallic oxides, by M. Henri Moissan. In all the experiments, the simple elevation of temperature produced the crystallization of all the metallic oxides experimented upon.—On the existence of the diamond in meteoric iron of the Cañon Diablo, by M. C. Friedel. A careful analysis has placed beyond doubt the existence of diamond in a portion of the Arizona meteorite presented to the Ecole des Mines. It occurs in small grains or a fine powder disseminated through the iron.—On the laws of expansion of fluids at constant volume; coefficients of pressure, by E. H. Amagat.—On the means of diminishing the pathogenic power of fermented beet-root pulp, by M. Arloing.—On the employment of free balloons for meteorological observations at very great heights, by M. Ch. Renard.—Photographic observations of Holmes's comet, by M. H. Deslandres.—On the locus of the mean distances of a point of an ordinary epicycloid, and of the successive centres of curvature which correspond to it, by M. G. Fouret.—On ordinary linear differential equations, by M. Jules Cels.—On the common cause of the evaporation and surface tension of liquids, by M. G. van der Mensbrugghe.—On the relation between the velocity of light and the size of the molecules of refracting liquids, by M. P. Joubin. From a comparison of a large number of substances the following law is deduced: The refraction is proportional to the square root of the quotient of the weight of the molecule by the number of constituent atoms (mean weight of the atom).—On the anomalous propagation of the light waves of Newton's rings, by M. Ch. Fabry.—On transparent diffusing globes, by M. Frédureau.—On a relation between molecular heat and the dielectric constant, by M. Runolfsson.—On the employment of guard-ring condensers and absolute electrometers, by M. P. Curie.—On the density of oxide of carbon and the atomic weight of carbon, by M. A. Leduc.—Critical reduction of Stas's fundamental determinations on potassium chlorate, by M. G. Hinrichs.—On a chloro-iodide of carbon, by M. A. Besson.—Action of anhydrous hydrofluoric acid on the alcohols, by M. Maurice Meslans.—Action of sulphuric acid on citrene, by MM. G. Bouchardat and J. Lafont.—Analysis of sulphate of quinine and quantitative determination of quinine in presence of the other cinchona alkaloids, by M. L. Barthe.—On the assimilation of the omasum to the abomasum of the Ruminants from the point of view of the formation of their mucous membrane, by M. J. A. Cordier.—On the differential osteological characters of rabbits and hares; comparison with leporides, by M. F. X. Lesbre.—Remarks on the preceding communication, by M. Milne-Edwards.—Myxosporidia of the bile-duct of fishes; new species, by M. P. Thélohan.—Method for ensuring the conservation of vitality in plants brought from distant tropical regions, by M. Maxime Cornu.—On the difference of transmissibility of pressures across ligneous, herbaceous, and succulent plants, by M. Gaston Bonnier.—On the structure of the *Gleicheniaceæ*, by M. Georges Poirault.—Salivary secretion and electric excitation, by M. N. Wedensky.—Action of the extract of cows' blood on animals affected with glanders, by M. A. Babes.—The blizzard of December 6 and 7, 1892, by M. Ch. V. Zenger.

BOOKS and SERIALS RECEIVED.

BOOKS.—The Elements of Graphic Statics: L. M. Hoskins (Macmillan).—Qualitative Analysis Tables and the Reactions of certain Organic Substances: Dr. E. A. Letts (Belfast, Mayne and Boyd).—Lord Rosse on the Gospel: Modernized by E. L. Garbett (W. Reeves).—An Atlas of Astronomy: Sir R. S. Ball (Philip).—Pioneers of Science: Prof. O. Lodge (Macmillan).—Collected Mathematical Papers of Prof. A. Cayley: Vol. V. (Camb. Univ. Press).—British Journal Photographic Almanac, 1893 (Greenwood).—A Manual of Bacteriology: Dr. G. M. Sternberg (New York, Wood).—La Terre Les Mers et Les Continents: F. Priem (Paris, J. B. Baillière).

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